

VARIATION IN THE EMBOLUS OF *METAPHIDIPPUS*
INSIGNIS (BANKS) (ARANEAE: SALTICIDAE)

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Abstract.—Abnormal morphological variation in the emboli of male palpi of *M. insignis* from Minnesota and Montana is illustrated. Some of these emboli resemble normal emboli of *M. montanus*, a closely related species. This resemblance may lead to incorrect species determinations.

The palpus of the mature male spider is considered to offer the most consistent morphological elements for species discrimination. In some spider species parts of the palpus remain attached to the female epigynum as a normal consequence of mating (Exline and Whitcomb, 1965; Levi, 1970, 1973; McCrone and Levi, 1964). It is suspected in these species, that an individual female mates once or twice, and the loss of the male palpal elements prevents other males from mating with the same females. Since striking differences can occur in morphology between virgin and mated males, taxonomists must take this source of variation into account. However, since these parts break at the same points, and may be recovered from the epigyna, once this process is recognized little difficulty will be encountered in interpreting such variation taxonomically.

This paper describes a variation in palpal structure which is more difficult to explain, and may be taxonomically misleading. The embolus is the intermittent sclerite in male spiders. In the genus *Metaphidippus* it offers a reliable morphology for distinguishing species. Indeed it is almost the only criterion used to separate preserved male specimens, although differences may be subtle (Kaston, 1973). Figure 1A depicts a ventral view of the cymbium, bulb and embolus of a typical male *M. insignis* from Minnesota. This differs only slightly from the embolus illustrated by Kaston (1973). The embolus of *M. montanus* (Emerton), a closely related species, is shown in Figure 1B. The remaining figures are of aberrant emboli of specimens from Minnesota and Montana. The embolus illustrated in Figure 1C resembles that of *M. montanus* closely, yet the other palpus, body pattern, and body size are those of typical *M. insignis*.

Out of 39 male *M. insignis* taken in Minnesota, 9 exhibited at least one abnormal palpus. One example (not illustrated) had 2 extremely abnormal palpi in which all elements of the palpus were deformed. This may represent a true teratology, or may be the result of abnormal conditions during the final molt. There is no geographic clustering evident in these specimens, they come from all over the range of the species in the state. One gets the

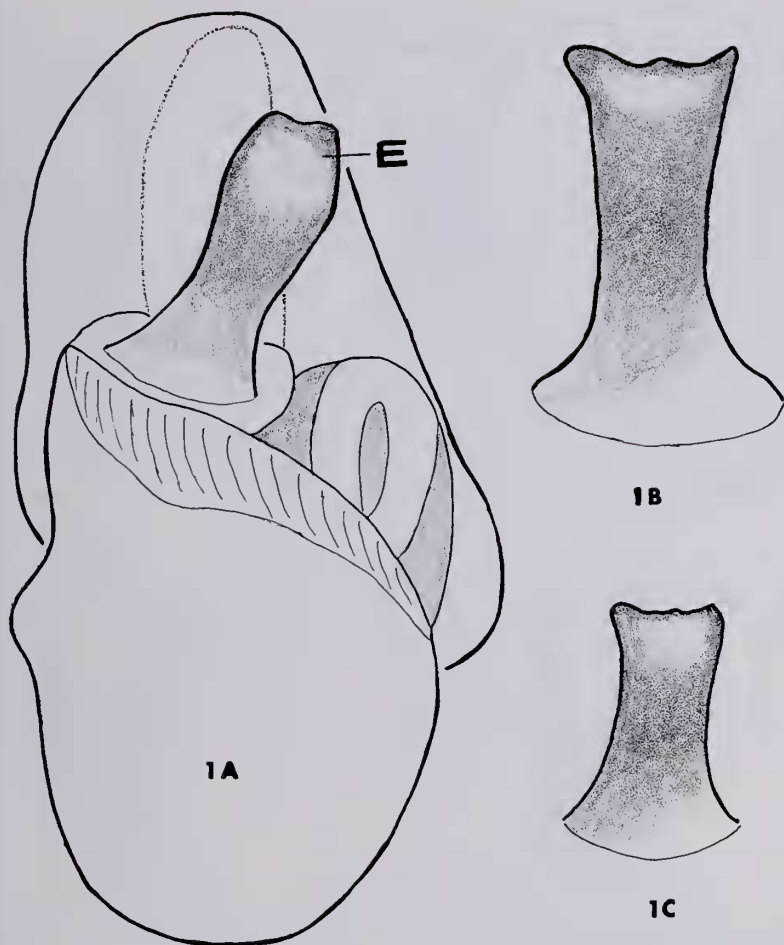


Fig. 1. A = Ventral view of typical left palpal tarsus of male *Metaphidippus insignis* from Minnesota, E is the embolus. B = Ventral view of left embolus of *Metaphidippus montanus* from Manitoba. C = Ventral view of aberrant left embolus of *Metaphidippus insignis* from Petroleum County, Montana.

impression that the typical rounded embolus tip has broken off to a variable degree producing the angular aberrant emboli. Over 50 females, including some collected at the same time as the males with atypical emboli, were examined. None had embolic remnants in the epigyna. I have also examined 4 males from Wyoming and Montana, and one of these has an abnormal embolus (Fig. 1C).

Kaston (1973) did not indicate any range of morphological variation in the emboli of *Metaphidippus* covered in his study. Galiano (1963) encountered

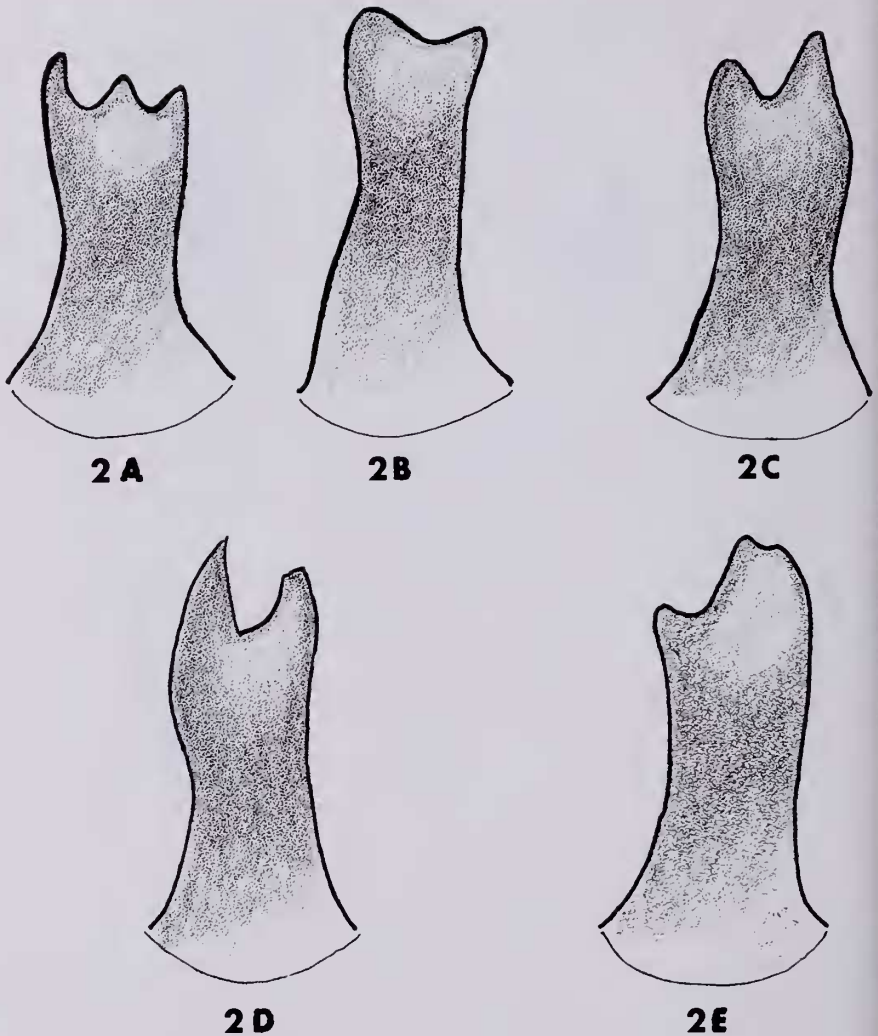


Fig. 2. Ventral views of aberrant emboli of *Metaphidippus insignis* from Minnesota. A = Left embolus of a male from Ramsey County. B = Right embolus of the same male as in A. C = Left embolus of a different male from Ramsey County. D = Right embolus of male from Ottertail County. E = Left embolus of another male from Ramsey County. Nonillustrated males similar to the illustrated specimens were from Norman, Pipestone, Stearns and Winona Counties.

an extreme range of variation in palpal morphology in male *Euophrys* (Salticidae) reared from one eggsac. Possibly some of this variation was the result of rearing. Male spiders often have difficulty in freeing the palpi during the final molt under laboratory conditions, although this usually affects the

structure of the other palpal elements rather than the embolus (personal observations). The few male *M. insignis* I have reared from wild caught immatures had typical palpi when mature. Perusal of the literature uncovered no species of jumping spider where a palpal element is broken off during mating.

I cannot explain the variations seen in *M. insignis*. I have examined hundreds of specimens of other species of *Metaphidippus* from Minnesota, and have never found any variation of the magnitude shown here in the emboli of these other species. It is possible that Minnesota and states to the west might lie in a hybrid zone between *M. insignis* and *M. montanus*. Unfortunately, few specimens are available from surrounding states and provinces to adequately study the problem.

M. insignis is found from New England and Ontario south to New Jersey, and west in the northern tier of states to the Rocky Mountains. In Minnesota, it is a grassland and meadow species, not found on primarily forested sites. *M. montanus* is found in the boreal forest from Newfoundland to the District of Mackenzie, and south in the high mountains of New England and New York. Many specimens determined as this species in collections, especially from the Rocky Mountains, belong elsewhere. It is a larger species than *M. insignis* with a slightly different body pattern. All known eastern records indicate that the species are allopatric.

As a precautionary measure, both palpi should be examined during determinations in this species group. Bilateral asymmetries and abnormal palpi will become apparent, and be less misleading.

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